

CLAIMS

What is claimed is:

- 1 1. A method of preparing a crystal polymorph, comprising the steps of:
2 a. preparing a supersaturated solution of a known substance;
3 b. selecting a polarization state of light to induce the onset of
4 nucleation of crystals of the polymorph of the known substance from the
5 supersaturated solution; and
6 c. subjecting the supersaturated solution to the light for a period
7 of time so as to induce the onset of nucleation of the crystals of the polymorph.
- 1 2. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the supersaturated solution is aged for a period of 1 hour to 200 hours.
- 1 3. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the light is at most minimally absorbed by the supersaturated solution.
- 1 4. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the wavelength of the light is near infrared.
- 1 5. The method of preparing a crystal polymorph as claimed in Claim 4,
2 wherein the wavelength of the light is 1064 nm.
- 1 6. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the light has linear polarization.
- 1 7. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the light has circular polarization.
- 1 8. The method of preparing a crystal polymorph as claimed in Claim 1,
2 wherein the light has elliptical polarization.
- 1 9. The method as claimed in Claim 1, wherein the polymorph is used
2 as a substitute for known polymorphs made under known conditions.
- 1 10. The method as claimed in Claim 1, wherein the polymorph is used
2 as a seed material to create larger amounts of the polymorph to be used in
3 known processes.
- 1 11. The method as claimed in Claim 1, wherein supersaturation is
2 achieved by a method selected from the group consisting of cooling, heating,
3 solvent evaporation, and altering solvent composition.

1 12. The method as claimed in Claim 11, wherein the solvent is selected
2 from the group consisting of organic solvents, inorganic solvents, and
3 supercritical solvents.

1 13. The method as claimed in Claim 1, wherein the substance is
2 selected from the group consisting of pharmaceuticals, amino acids, peptides,
3 proteins, carbohydrates, amines, alkanes, alkenes, alkynes, aromatics,
4 heterocyclic compounds, alcohols, organometallics, and carboxylic acids.

1 14. The method as claimed in Claim 1, wherein the laser light is pulsed.

1 15. The method as claimed in Claim 14, wherein the laser light is
2 pulsed at between 1 and 100 pulses per second.

1 16. The method as claimed in Claim 15, wherein the laser light pulses
2 at 10 pulses per second.

1 17. The method as claimed in Claim 1, wherein the supersaturated
2 solution is subjected to the laser light for a period of between 0.01 second and 1
3 hour.

1 18. The method as claimed in Claim 17, wherein the supersaturated
2 solution is subjected to the laser light for a period of between 0.01 second and 60
3 seconds.

1 19. A method of preparing a crystal polymorph, comprising the steps of:
2 a. preparing a supersaturated solution of a known substance;
3 b. aging the supersaturated solution for a period of 1 hour to
4 200 hours;
5 c. subjecting the supersaturated solution to the light from a
6 near-infrared laser emitting light at a selected polarization state for a period of
7 time so as to induce the onset of nucleation of the crystals of the polymorph.

1 20. The method of preparing a crystal polymorph as claimed in Claim
2 19, wherein the wavelength of the light is 1064 nm.

1 21. The method of preparing a crystal polymorph as claimed in Claim
2 20, wherein the power of the light is between 0.1 GW/cm² and 10 GW/cm².

1 22. The method of preparing a crystal polymorph as claimed in Claim
2 19, wherein the light has linear polarization.

1 23. The method of preparing a crystal polymorph as claimed in Claim
2 19, wherein the light has circular polarization.

1 24. The method of preparing a crystal polymorph as claimed in Claim
2 19, wherein the light has elliptical polarization.

1 25. The method as claimed in Claim 19, wherein the laser light is
2 pulsed at between 1 to 100 pulses per second.

1 26. The method as claimed in Claim 25, wherein the laser light pulses
2 at 10 pulses per second.

1 27. The method as claimed in Claim 26, wherein the supersaturated
2 solution is subjected to the laser light for a period of between 0.01 second and 1
3 hour.

1 28. The method as claimed in Claim 27, wherein the supersaturated
2 solution is subjected to the laser light for a period of 0.01 second and 60 seconds
3 and the light is at most minimally absorbed by the supersaturated solution.

1 29. The method as claimed in Claim 25, wherein supersaturation is
2 achieved by a method selected from the group consisting of cooling, heating,
3 solvent evaporation, and altering solvent composition.

1 30. The method as claimed in Claim 29, wherein the solvent is selected
2 from the group consisting of organic solvents, inorganic solvents, and
3 supercritical solvents.

1 31. A method of preparing a crystal polymorph from a known
2 substance, comprising the steps of:

3 a. preparing a supersaturated solution of the known substance;

4 b. aging the supersaturated solution for a period of 1 hour to
5 200 hours;

6 c. selecting a polarization state of laser light to induce the onset
7 of nucleation of crystals of the crystal polymorph of the known substance from the
8 supersaturated solution, wherein the light is at most minimally absorbed by the
9 supersaturated solution; and

10 d. subjecting the supersaturated solution to the laser light for
11 between 0.01 second and 1 hour so as to induce the onset of nucleation of the
12 crystals of the polymorph.

1 32. The method as claimed in Claim 31, wherein the laser light is
2 pulsed at between 1 and 100 pulses per second.

1 33. The method as claimed in Claim 32, wherein the laser light pulses
2 at 10 pulses per second.

1 34. The method as claimed in Claim 33, wherein the supersaturated
2 solution is subjected to the laser light for a period of between 0.01 second and 60
3 seconds.

1 35. The method as claimed in Claim 31, wherein the substance is
2 selected from the group consisting of pharmaceuticals, amino acids, peptides,
3 proteins, carbohydrates, amines, alkanes, alkenes, alkynes, aromatics,
4 heterocyclic compounds, alcohols, organometallics, and carboxylic acids.

1 36. The method as claimed in Claim 35, wherein supersaturation is
2 achieved by a method selected from the group consisting of cooling, heating,
3 solvent evaporation, and altering solvent composition.

1 37. The method as claimed in Claim 34, wherein the solvent is selected
2 from the group consisting of organic solvents, inorganic solvents, and
3 supercritical solvents.

1 38. The method of preparing a crystal polymorph as claimed in Claim
2 35, wherein the wavelength of the light is near infrared.

1 39. The method of preparing a crystal polymorph as claimed in Claim
2 38, wherein the wavelength of the light is 1064 nm.

1 40. The method of preparing a crystal polymorph as claimed in Claim
2 31, wherein the laser light has a polarization state selected from the group
3 consisting of linear polarization, circular polarization, and elliptical polarization.

1 41. The method of preparing a crystal polymorph as claimed in Claim
2 40, wherein the light has linear polarization.

1 42. The method of preparing a crystal polymorph as claimed in Claim
2 40, wherein the light has circular polarization.

1 43. The method of preparing a crystal polymorph as claimed in Claim
2 40, wherein the light has elliptical polarization.

1 44. The method as claimed in Claim 31, wherein the polymorph is used
2 as a substitute for known polymorphs made under known conditions.

45. The method as claimed in Claim 31, wherein the polymorph is used
as a seed material to create larger amounts of the polymorph to be used in
known processes.

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